Claims

We claim:

- 1 1. A method for summarizing a compressed video, comprising:
- detecting audio peaks in an audio signal of the video;
- quantizing motion activity in the video as a continuous stream of pulses;
- 4 and

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- correlating the audio peaks with the stream of quantized pulses to identify uninteresting events and interesting events in the video to summarize the video.
- 2. The method of claim 1 further comprising:

discarding frames of the video associated with the uninteresting events; and concatenating frames of the video associated with the interesting events to form a summary of the video.

- 3. The method of claim 1 further comprising:
- sub-sampling the audio signal of the video down to a volume contour; and
- applying a sliding window to the volume contour to detect a local maximum
- 4 corresponding to a particular audio peak.
- 4. The method of claim 3 where the local maximum is detected when (localMax -
- 2 localMin) > (globalMax globalMin)/3, using a local minimum, and
- 3 predetermined global maximum and a predetermined global minimum.
- 5. The method of claim 3 wherein the sliding window has a duration of one minute,
- 2 and slides forward in time in half minute steps.

1	6. The method of claim 1 further comprising:
2	extracting the motion activity from each P-frame in the video;
3	applying a moving average filter and a moving median filter to the extracted
4	motion activity to generated smoothed motion activity; and
5	setting the smoothed motion activity for each P-frame to one if greater than a
6	predetermined threshold, and zero otherwise to quantize the motion activity as the
7	continuous stream of pulses.
1	7. The method of claim 1 further comprising:
2	measuring an average of magnitudes of motion vectors of each P-frame to
1.000.2 n n 3 mm, 100, 100, 100, 100, 1	extract the motion activity.
<u> </u> 	8 The method of claim 6 wherein the predetermined threshold is half a mean
2	motion activity of the compressed video.
į	9. The method of claim 6 further comprising:
2	testing each pulse to determine whether the quantized motion activity is at
3	one for at least a first predetermined length of time before falling to zero and
4	remains at zero for a second predetermined length of time; and
5	selecting the test pulse as a candidate pulse associated with a particular
5	interesting event in the video.
L	10. The method of claim 9 further comprising:
2	discarding pulses failing the test from the continuous stream of pulses; and
3	transforming each candidate pulse to have a third predetermined length of
1	time.

- 1 11. The method of claim 10 further comprising:
- 2 merging the transformed pulses, time-wise, with the detected audio peaks to
- 3 obtain a set of time-correlated transformed pulses and audio peaks.
- 1 12. The method of claim 11 further comprising:
- testing if a rising edge of a particular transformed pulse is less than ten
- 3 seconds after a particular time-correlated audio peak; and
 - designating an entire duration starting from the particular audio peak and ending at a first falling edge after the particular audio peak is as a particular interesting event if true.
 - 13. The method of claim 11 further comprising:
 - testing if a falling edge of a particular transformed pulse is less than two seconds before a particular audio peak; and
 - designating an entire duration starting from an immediately preceding rising edge and ending at the particular audio peak as a particular interesting event if true.
- 1 14. A system for summarizing a compressed video, comprising:
- 2 means for detecting audio peaks in an audio signal of the video;
- means for quantizing motion activity in the video as a continuous stream of
- 4 pulses; and
- 5 means for correlating the audio peaks with the stream of quantized pulses to
- 6 identify uninteresting events and interesting events in the video to summarize the
- 7 video.

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1 15. The system of claim 14 further comprising: means for discarding frames of the video associated with the uninteresting 2 3 events; and 4 means for concatenating frames of the video associated with the interesting 5 events to form a summary of the video. 1 16. The system of claim 14 further comprising: 2 means for extracting the motion activity from each P-frame in the video; 3 means for applying a moving average filter and a moving median filter to the -4 extracted motion activity to generated smoothed motion activity; and 15 16 means for setting the smoothed motion activity for each P-frame to one if greater than a predetermined threshold, and zero otherwise to quantize the motion activity as the continuous stream of pulses. 17. The system of claim 16 further comprising: means for testing each pulse to determine whether the quantized motion activity is at one for at least a first predetermined length of time before falling to

zero and remains at zero for a second predetermined length of time; and

particular interesting event in the video.

means for selecting the test pulse as a candidate pulse associated with a

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